

**METHODS AND COMPOSITIONS FOR THE
TREATMENT OF EMPHYSEMA USING 13-CIS-RETINOIC ACID**

ABSTRACT

The current invention is directed to methods of treating or preventing emphysema, pharmaceutical compositions suitable for the treatment or prevention of emphysema and methods for delivering formulations into the lung of a mammal suffering from emphysema.

More generally, the invention encompasses the use of 13-*cis*-retinoic acid to treat or prevent certain chronic obstructive airway disorders, particularly chronic obstructive pulmonary disease including chronic bronchitis, emphysema and asthma in mammals, especially humans that smoke or smoked cigarettes. In another aspect, the present invention encompasses the use of pharmaceutical compositions of 13-*cis*-retinoic acid to treat emphysema. Moreover, the current invention encompasses the use of electrohydrodynamic aerosol devices, aerosol devices and nebulizers to deliver formulations of 13-*cis*-retinoic acid into the lung of a mammal suffering from emphysema. The invention also encompasses the systemic use as well as the local use of 13-*cis*-retinoic acid. In another aspect the current invention encompasses a pharmaceutical composition for preventing emphysema in a human at risk of emphysema through administration of a amount of 13-*cis*-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof in a pharmaceutically acceptable carrier, that is sufficient to prevent emphysema.